REMARKS

Claim 1 has been amended with the limitations of dependent claims 2 and 4. Claim 16 was likewise amended with the limitations of claim 19. The previously proposed cancellation of claim 17 and inclusion of the limitations into claim 16 has been undone. Claim 35 was amended with the limitations from claim 37. Claim 39 was amended with the limitations from claim 41. Claims 1, 33, 35, and 39 have been further amended to recite a capacitive microfabricated electrostatic transducer. These limitations are supported in the title and at paragraphs 15, 36 and 37. Claims 1 and 39 have been further amended to recite the balancing circuit being an active circuit. These limitations are supported at paragraphs 11, 16, and 53-57. Claims 1, 33, 35, and 39 have also been amended to recite the receive signal path receiving an electric receive signal generated with transduction from ultrasound energy by the ultrasonic transducer and outputting the electric receive signal to an imaging system. Claims 16 and 31have been amended to recite a receive signal path for reception of electrical signals representing ultrasound echoes. These limitations are supported at paragraphs 7, 40, 52, and Figure 6. Other support may be provided.

In the Office Action, claims 1-42 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent App. Pub. 200410047477 Al ("Bank"). Claims 1-42 were also rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-42 of over U.S. Patent No. 6,726,626 ("Hossack").

Applicants respectfully request reconsideration of the rejections of claims 1-42.

A terminal disclaimer was filed and accepted. As noted in the Advisory Action, the nonstatutory obviousness-type double patent rejection over Hossack has been overcome.

Independent claim 1 recites, *inter alia,* identifying the transducer circuit having an ultrasonic transducer that includes at least one reactance characteristic and an operating frequency range, and at least one signal path that is electrically coupled to the ultrasonic transducer, the at least one signal path including a receive signal path.

Bank does not disclose or suggest identifying the transducer circuit having an ultrasonic transducer that includes at least one reactance characteristic and an operating frequency range,

and at least one signal path that is electrically coupled to the ultrasonic transducer, the at least one signal path including a receive signal path. Instead, Bank teaches power delivery systems for parametric loudspeakers. (para. [0001]). Bank does not teach any circuit with a receive signal path.

The Office Action cites to paragraphs [0002] and [0087] of Bank for "reception" or "receive signals." Paragraph [0002] discusses production and modulation of an ultrasonic carrier frequency with an audio input signal to generate an audible reproduction of the audio input signal. Paragraph [0087] teaches isolation of an AC power line from a load circuit. These paragraphs teach *generation* of an audio signal and *isolation* of a power line, not a *receive* signal path that is electrically coupled to the ultrasonic transducer, as recited in the claim.

One of ordinary skill in the art would not have electrically coupled a receive signal path to an ultrasonic transducer in view of Bank because Bank is directed to *loudspeaker* technology, and thus audio signal *generation,* not reception.

In response, the Examiner alleges that, while in the form of a speaker, the transducer includes a receive signal path as the speaker functions by converting electrical energy into ultrasonic vibratory signals. The electric coupling is understood to be a receive path as the receive signal and its associated path are not otherwise characterized by the claims. The Examiner further notes that the remarks are directed to signal reception, but the claims merely receive signals.

However, Bank, et al. do not disclose a receive signal path that is electrically coupled to the ultrasonic transducer. Bank, et al. have a path for electrically coupling the electrical energy to the transducer for conversion into ultrasonic vibratory signals. This path is for transmit signals. The electrical signals applied to the path are for transmitting from the transducer. Bank, et al. do not provide a path for receive signals, so do not provide a receive signal path.

To further clarify this distinction, the limitations of claims 2 and 4 have been added to claim 1. Claim 1 recites both a transmit signal path and a receive signal path where the balancing circuit is inserted into the receive signal path. Bank, et al. provide one path coupling to the transducer. The path is a transmit signal path. The transducer transmits using signals

provided on the transmit signal path.

Even accepting the Examiner's argument that this path of Bank, et al. is a receive signal path, there is not a second path. Claim 1 recites transmit and receive signal paths. Bank, et al. do not provide two paths, one for transmit signals and one for receive signals. In Bank, et al., any balancing is done on the transmit signal path, not the receive signal path.

In the Advisory Action, the Examiner alleges that the placement of the balancing circuit within the receive signal path is nominal to the method and is considered an obvious design choice, and that Bank, et al. include both transmit and receive paths such that it is operable. However, Bank, et al. only need a transmit path to be operable. A receive path is not needed for a speaker. It would not be an obvious design choice to put the balancing circuit in a receive path as no such receive path is even provided.

To further clarify this distinction, claim 1 has been amended to recite receive signal path receiving an electric receive signal generated with transduction from ultrasound energy by the ultrasonic transducer and outputting the electric receive signal to an imaging system. In the Advisory Action, the Examiner noted that clarifying to provide the receive signal as an ultrasound signal could distinguish from Bank, et al. Bank, et al. provide signals to a transducer to generate sound (transmit path). Bank, et al. do not use the transducer to generate a receive signal transduced from ultrasound energy. Bank, et al. do not have a receive path to output the electric receive signal to an imaging system.

Claim 1 recites more than merely the balancing circuit. Placement within the receive signal path is not merely nominal, but is important. The receive signal path operates over a range of frequencies according to claim 1, not just optimization for a narrow frequency. This characteristic makes use of balancing in a receive signal path different than in a transmit signal path.

To further clarify this distinction, claim 1 has been amended to recite that the balancing circuit comprises an active circuit. Bank, et al. use a passive inductor (paragraphs 75-79). As noted in paragraph 82, Bank, et al. propose a network of passive devices to increase bandwidth. A person of ordinary skill in the art would not have used an active circuit for the balancing circuit.

Claim 1 also recites that the ultrasonic transducer is a capacitive microfabricated electrostatic transducer. Bank, et al. provide a parametric loudspeaker (paragraph 1) implemented with a transducer 118, 132, 148, 264, 290, and 318 (paragraphs 52, 59, 60, 75, 79, and 82). The transducer is described as an inductive transducer 304 (paragraph 80), electrostatic, piezoelectric, or other transducer type (paragraph 87). Bank, et al. do not disclose a capacitive microfabricated electrostatic transducer.

One or more of the remarks provided for claim 1 also apply to claims 16, 31, 33, 35, and 39. Claims 31, 33, and 35 are allowable for the type of transducer, receive path, and type of receive path reasons, similar to claim 1. Claim 39 is allowable for the type of transducer, receive path, type of receive path, and active circuit reasons, similar to claim 1.

Claims 16 and 31 recite reception of electrical signals representing ultrasound echoes. In the Advisory Action, the Examiner noted that clarifying to provide the receive signal as an ultrasound signal could distinguish from Bank, et al. Claims 16 and 31 have been clarified. Bank, et al. do not provide signals representing ultrasound echoes.

Independent claim 31 also recites, *inter alia,* isolating the negative capacitor from the ultrasonic transducer during a transmission of the transducer circuit using a plurality of switches.

Bank does not disclose or suggest isolating the negative capacitor from the ultrasonic transducer during a transmission of the transducer circuit using a plurality of switches. Instead, Bank teaches four switching power devices 120a-120d in a Class D amplifier with an H-bridge amplifier. (para. [0002]). The four switching power devices 120a-120d switch *power* received from a DC power source line 122 to create a pulse width modulated AC signal with a particular frequency (i.e. the "switching frequency"). (see, e.g., paras. [0051][0057]). The switching power devices do not *isolate* the negative capacitor from the ultrasonic transducer during a transmission of the transducer circuit, as recited in the claim.

One of ordinary skill in the art would not have isolated a negative capacitor from an ultrasonic transducer during a transmission of a transducer circuit using a plurality of switches in

view of Bank because Bank is directed to improving power efficiency in a parametric loudspeaker system, and isolating a negative capacitor from Bank's transducer would decrease power efficiency by removing the counterbalancing reactive load.

In the Advisory Action, the Examiner cites to paragraphs 58, 60, 69 and 84 to show switching to isolate the balancing circuit. However, paragraphs 58, 60, and 69 relate to the type of power supply, as shown in Figures 2, 3, and 8. These figures show the power being switched, but the following circuit components are not connected or disconnected from the transducer based on this switching. The balancing circuit components are between the power switching supply and the transducer, so these switches do not isolate any negative capacitance from the transducer.

Paragraph 84 relates to a variable inductor shown in Figure 28. This inductor may be adjusted to different values, but does not isolate itself from the transducer.

The switch devices of Bank, et al. do not isolate a negative capacitor from the ultrasonic transducer.

A similar argument as presented above with respect to claim 31 also applies to independent claim 33.

Claim 35 recites a receive signal path and further recites isolating the balancing circuit from the plurality of ultrasonic transducers during a transmission of the transducer circuit. The transducer of Bank, et al. has one path for transmitting and any balancing circuit is applied during the transmission of the transducer, not isolated from the transmission. Claim 39 is allowable for similar reasons.

Dependent claims 3, 5-15, 18, 20-30, 32, 34, 36, 38, 40, and 42 each depend from one of the above independent claims and are allowable for at least the same reasons as their respective base claim. Further features patentably distinguish from Bank, et al.

Claims 8, 11, 23 and 26 are allowable for the isolation reasons provided above for claim 31.

CONCLUSION

Applicant respectfully submits that all of the pending claims are in condition for allowance and seeks early allowance thereof.

PLEASE MAIL CORRESPONDENCE TO:

Siemens Corporation
Customer No. 28524
Attn: Elsa Keller, Legal Administrator
170 Wood Avenue South
Iselin, NJ 08830

Respectfully submitted,

/Jenny G. Ko/
Jenny G. Ko, Reg. No. 44,190
Attorney(s) for Applicant(s)
Telephone: 650-694-5330
Date: August 18, 2009